

**Amendment and Response**

Applicant: David C. Collins

Serial No.: 10/821,130

Filed: April 8, 2004

Docket No.: 200400519-1

Title: GENERATING AND DISPLAYING SPATIALLY OFFSET SUB-FRAMES

---

**IN THE CLAIMS**

Please amend the claims as follows.

1. (Currently Amended) A method of displaying an image with a display device, the method comprising:

receiving image data for the image with an image processing unit;

generating first and second sub-frames to include first and second sub-frame pixel values, respectively, and wherein the first sub-frame pixel value is calculated using the image data and the second sub-frame pixel value with the image processing unit; and

alternating between displaying the first sub-frame, including displaying the first sub-frame pixel value, in a first position with the display device and displaying the second sub-frame, including displaying the second sub-frame pixel value, in a second position spatially offset from the first position with the display device;

wherein a region of influence associated with the first sub-frame pixel value comprises a number of pixel values that corresponds to a number of iterations used to generate the first and second sub-frames.

2. (Currently Amended) The method of claim 1 further comprising:

generating third and fourth sub-frames to include third and fourth sub-frame pixel values, respectively, with the image processing unit; and

alternating between displaying the first sub-frame in the first position with the display device and displaying the second sub-frame in the second position spatially offset from the first position with the display device, displaying the third sub-frame, including displaying the third sub-frame pixel value, in a third position spatially offset from the first position and the second position with the display device, and displaying the fourth sub-frame, including the fourth sub-frame pixel value, in a fourth position spatially offset from the first position, the second position, and the third position with the display device.

3. (Canceled)

**Amendment and Response**

Applicant: David C. Collins

Serial No.: 10/821,130

Filed: April 8, 2004

Docket No.: 200400519-1

Title: GENERATING AND DISPLAYING SPATIALLY OFFSET SUB-FRAMES

---

4. (Currently Amended) The method of claim 2 wherein the first sub-frame pixel value is calculated with the image processing unit using the image data, the second sub-frame pixel value, and the third sub-frame pixel value.
5. (Canceled)
6. (Currently Amended) The method of claim 1 further comprising:  
generating the first and the second sub-frames with the image processing unit using a simulation kernel.
7. (Currently Amended) The method of claim 1 further comprising:  
generating the first and the second sub-frames with the image processing unit using an error kernel.
8. (Previously Presented) The method of claim 1 wherein the image comprises a first and second image pixels, wherein the first and the second sub-frame pixel values correspond to first and second sub-frame pixels, respectively, that are centered with respect to the first and the second image pixels, respectively.
9. (Currently Amended) The method of claim 1 further comprising:  
generating the first and the second sub-frames, wherein the first sub-frame pixel value is calculated with the image processing unit using the image data, the second sub-frame pixel value, and a plurality of sharpening factors.
10. (Original) The method of claim 1 wherein the image data comprises a plurality of pixels at a first resolution, and wherein the first and the second sub-frames comprise a second plurality of pixels at a second resolution less than the first resolution.
11. (Currently Amended) A system for displaying an image, the system comprising:  
a buffer adapted to receive image data for the image;

**Amendment and Response**

Applicant: David C. Collins

Serial No.: 10/821,130

Filed: April 8, 2004

Docket No.: 200400519-1

Title: GENERATING AND DISPLAYING SPATIALLY OFFSET SUB-FRAMES

---

an image processing unit configured to generate first and second sub-frames comprising a plurality of rows of sub-frame pixel values, wherein each of the sub-frame pixel values in each of the plurality of rows is calculated using the image data and at least one sub-frame pixel value from a previous one of the plurality of rows; and

a display device adapted to alternately display the first sub-frame in a first position and the second sub-frame in a second position spatially offset from the first position;

wherein each of the sub-frame pixel values in each of the plurality of rows is calculated using a number of pixel values from the image data and the previous one of the plurality of rows that corresponds to a number of iterations used to generate the first and second sub-frames.

12. (Original) The system of claim 11 wherein the image processing unit is configured to generate the first and the second sub-frames using a simulation kernel.

13. (Original) The system of claim 12 wherein the simulation kernel comprises first, second, and third rows which each comprise three coefficients, wherein the three coefficients of the first row have values of  $1/4$ ,  $1/4$ , and 0, respectively, wherein the three coefficients of the second row have values of  $1/4$ ,  $1/4$ , and 0, respectively, and wherein the three coefficients of the third row have values of 0, 0, and 0, respectively.

14. (Original) The system of claim 12 wherein the simulation kernel comprises first, second, and third rows which each comprise three coefficients, wherein the three coefficients of the first row have values of  $1/2$ ,  $1/2$ , and 0, respectively, wherein the three coefficients of the second row have values of  $1/2$ ,  $1/2$ , and 0, respectively, and wherein the three coefficients of the third row have values of 0, 0, and 0, respectively.

15. (Original) The system of claim 12 wherein the simulation kernel comprises first, second, and third rows which each comprise three coefficients, wherein the three coefficients of the first row have values of 0,  $1/8$ , and 0, respectively, wherein the three coefficients of the second row have values of  $1/8$ ,  $4/8$ , and  $1/8$ , respectively, and wherein the three coefficients of the third row have values of 0,  $1/8$ , and 0, respectively.

**Amendment and Response**

Applicant: David C. Collins

Serial No.: 10/821,130

Filed: April 8, 2004

Docket No.: 200400519-1

Title: GENERATING AND DISPLAYING SPATIALLY OFFSET SUB-FRAMES

---

16. (Original) The system of claim 12 wherein the simulation kernel comprises first, second, and third rows which each comprise three coefficients, wherein the three coefficients of the first row have values of  $1/16$ ,  $2/16$ ,  $1/16$ , respectively, wherein the three coefficients of the second row have values of  $2/16$ ,  $4/16$ ,  $2/16$ , respectively, and wherein the three coefficients of the third row have values of  $1/16$ ,  $2/16$ ,  $1/16$ , respectively.

17. (Original) The system of claim 11 wherein the image processing unit is configured to generate the first and the second sub-frames using an error kernel.

18. (Original) The system of claim 17 wherein the error kernel comprises first, second, and third rows which each comprise three coefficients, wherein the three coefficients of the first row have values of 0, 0, and 0, respectively, wherein the three coefficients of the second row have values of 0,  $1/4$ , and  $1/4$ , respectively, and wherein the three coefficients of the third row have values of 0,  $1/4$ , and  $1/4$ , respectively.

19. (Original) The system of claim 11 wherein the image processing unit is configured to generate third and fourth sub-frames comprising the plurality of rows of sub-frame pixel values, wherein each of the sub-frame pixel values in each of the plurality of rows is calculated using the image data and at least one sub-frame pixel value from a previous one of the plurality of rows.

20. (Currently Amended) A system for generating sub-frames for display at spatially offset positions to generate the appearance of an image, the system comprising:

means for receiving image data corresponding to the image;

means for generating a plurality of rows of initial values using the image data;

means for accessing a row of history values generated using the image data; and

means for generating a sub-frame pixel value using the row of history values and the plurality of rows of initial values;

**Amendment and Response**

Applicant: David C. Collins

Serial No.: 10/821,130

Filed: April 8, 2004

Docket No.: 200400519-1

Title: GENERATING AND DISPLAYING SPATIALLY OFFSET SUB-FRAMES

---

wherein the row of history values and the plurality of rows of initial values comprise a plurality of columns, wherein a number of the plurality of columns corresponds to a number of iterations associated with generating the sub-frame pixel value.

21. (Currently Amended) The system of claim 20 wherein a number of values in the row of history values and each of the plurality of rows of initial values corresponds to ~~a~~the number of iterations associated with generating the sub-frame pixel value.

22. (Canceled)

23. (Original) The system of claim 20 wherein the means for generating the sub-frame pixel value includes means for generating the sub-frame pixel value using the row of history values, the plurality of rows of initial values, a simulation kernel, and an error kernel.

24. (Original) The system of claim 20 wherein the means for generating the sub-frame pixel value includes means for generating the sub-frame pixel value using the row of history values, the plurality of rows of initial values, and a simulation kernel.

25. (Currently Amended) A computer-readable medium storing computer-executable instructions, which, when executed by a computer processing system, cause the system to perform a method of generating a sub-frame image which comprises a plurality of sub-frames for display at spatially offset positions to generate the appearance of an image, comprising:

receiving image data corresponding to the image;

generating a first plurality of initial values associated with a first pixel which corresponds to a first one of the plurality of sub-frames using the image data;

generating a first sub-frame pixel value using the image data and the first plurality of initial values, wherein the first sub-frame pixel value comprises a first history value;

generating a second plurality of initial values associated with a second pixel which corresponds to a second one of the plurality of sub-frames using the image data; ~~and~~

generating a second sub-frame pixel value using the image data, the second plurality of initial values, and the first history value;

**Amendment and Response**

Applicant: David C. Collins

Serial No.: 10/821,130

Filed: April 8, 2004

Docket No.: 200400519-1

Title: GENERATING AND DISPLAYING SPATIALLY OFFSET SUB-FRAMES

---

generating a third plurality of initial values associated with a third pixel which corresponds to a third one of the plurality of sub-frames using the image data;

generating a third sub-frame pixel value using the image data and the third plurality of initial values, wherein the third sub-frame pixel value comprises a second history value; and

generating the second sub-frame pixel value using the image data, the second plurality of initial values, the first history value, and the second history value.

26. (Canceled)

27. (Currently Amended) The computer-readable medium of claim ~~26~~25 storing computer-executable instructions, which, when executed by the computer processing system, cause the system to for perform the method further comprising:

generating a fourth plurality of initial values associated with a fourth pixel which corresponds to a fourth one of the plurality of sub-frames using the image data; and

generating a fourth sub-frame pixel value using the image data, the fourth plurality of initial values, and the first history value.

28. (Original) The computer-readable medium of claim 27 wherein the first sub-frame pixel value and the third sub-frame pixel value comprise a first row of a sub-frame image, and wherein the second sub-frame pixel value and the fourth sub-frame pixel value comprise a second row of the sub-frame image.

29. (Original) The computer-readable medium of claim 28 wherein the first, the second, the third, and the fourth pixels are centered with respect to a corresponding image pixel in the image.